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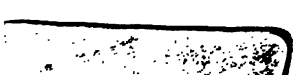
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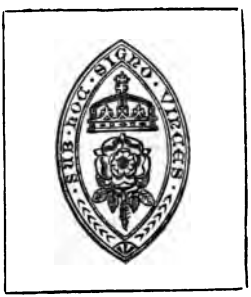
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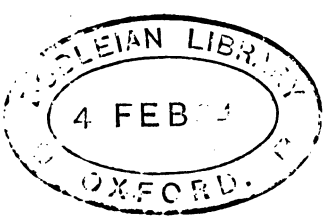
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HEALTH IN SCHOOLS.

INTRODUCTORY.

MUCH of our proverbial philosophy bears the superficial aspect of mere truism, hardly worth the reduction to words, save for the purpose of crystallizing into brief and coherent form the vague and floating impressions of unreflecting minds. And the phrase that "the boy is the father of the man," would at first sight seem to be one of the least profound of these familiar platitudes. On looking below the surface, however, we find that depth has not been entirely sacrificed to clearness, but that the phrase suggests some important lessons, which medical men, at all events, are not slow to appreciate. For although the very essence of fatalism may seem to be implied in the sentence of the absolute dependence of the future man on the paternal attributes of the boy, it does not require much thought to appreciate that these attributes are only partly implanted at birth, and that, to use another proverb, "according as the twig is bent so is the *bough inclined.*" The various diatheses and hereditary

tendencies transmitted from our ancestors cannot un
tunately be got rid of by any amount of care; but t
may be greatly lessened in virulence, and even indu
to lie dormant by scientifically directed precaution. A
it is most satisfactory to reflect, that as the period
growth and development is mainly concerned in c
structing a successful or an unsuccessful physical futu
the regulation of this success or failure depends in gr
measure on the common sense and knowledge of th
who have to steer the frail bark of early life through
rocks and quicksands with which it is surrounded.

The time has happily gone by when it was deen
fashionable to sneer at the development of what
called muscular Christianity, and when intellect was as
ciated with that pallor and slimness described in
æsthetic jargon of the period as "interesting." We
now beginning to recognise the necessity for robust hea
in these days of unnaturally keen competition, and
accept the blunt but expressive maxim of the writer w
tells us "that the first requisite for success in life is to
a good animal." That is to say, the real successes in
are to be looked for, not among the narrow-chested d
peptics, whose variable nervous systems tremble lik
barometer at every breeze and storm, but rather amo
those more roughly organised natures who can eat a
sleep and laugh through all the vicissitudes of fortune.

What, then, is really wanted for success is not the overloaded frame of the professional athlete, but so much muscular development as to ensure that the functions of life shall be vigorously sustained under the superintendence of an abundant store of healthy nervous energy, and this typical condition can only be satisfactorily acquired by a judicious blending of mental and bodily training in early years; and considering the importance, not only to the individual, but to the State, of keenness and precision in the weapons with which the battle of life is to be fought, the enormous responsibility assumed by those who undertake the management of the young comes strongly before us. During the first few years of life the child is under the watchful and loving supervision of its parents, and at this time the earliest dangers of its career are surmounted. The first dentition, the not infrequent difficulties of feeding, the incidence of epidemics, and the possible inroad of diathetic conditions, fill the nursery period with anxieties to the mother, but give the little one advantages in the way of care and attention for which it can never be too grateful. Throughout the purely vegetative period of infancy, when to eat and to sleep are the sole and all-absorbing occupations, and even later, when the inco-ordinate movements of childhood are being harmonised by practice, and the education of the senses *is rapidly going* on, the future Milton or Bacon differs

little, if at all, from the dusky pappoose of the red Indian. But with education, their walks in life diverge at a very acute angle. The savage grows up with a well-developed frame, hard and wiry, able to spend days and nights on foot, and to use his eyes and ears with a skill and certainty little short of marvellous; but his mental nature is dwarfed and stunted. Good although some of his instincts undoubtedly are, the absence of mental discipline has permitted a luxuriant growth of those evil tendencies which lie dormant in us all; and we accordingly find cruelty and revenge and superstition and treachery too often obscuring the higher qualities of his nature. Were we permitted to grow up without religious knowledge or intellectual training, we might not only emulate the moral deficiencies of the despised savage, but should probably superadd some of the vices peculiar to our own boasted state of civilisation. To correct any tendency to such deplorable results; to cultivate the virgin soil, not only with the ashes of the past, but the riches of the present; to inculcate a high morality; and to make duty, order, and discipline, the ruling motives of life, is a task which may well call into play the best qualities of our best minds; and it is in the highest degree satisfactory to see that the profession of teaching, whilst it is one of the *most important, is* now also one of the best remunerated *of all*

With the actual problems of education we have nothing to do, except in so far as they touch upon health and hygiene; but considering that children are now compelled to go to school, parents have more than ever a good right to demand that serious attention be given to the physical regulations necessary for preserving the due balance between body and mind. It is not unreasonable that they should expect teachers to have sufficient knowledge to prevent any injuriously one-sided development, either in the direction of work or play, to aid medical science in obviating diathetic tendencies, and to prevent that shipwreck of health which no doubt frequently happened before the laws of health became popularised.

In the following pages, so far as space will permit, we propose to consider some of the principles that should guide us in our inquiries into the physiology of education. To see what to encourage and what to avoid in the construction of schools; to regulate the dietary and the general division and arrangement of the day; and to consider what diseases are most common to school life, is a task upon which we enter with a certain amount of diffidence. For as yet there has been little attempt made to consider this subject in a systematic way, and the information already placed on record is scattered, and not always easy of access. We can only, of course,

supply the merest outline, and cannot go into that detail which would be necessary to make a hand-book of school hygiene complete and exhaustive. But our own experience can furnish a good deal, and we shall be thoroughly satisfied if we can persuade our readers that the dangers of school life have been greatly exaggerated, that they are now fairly well understood, and that for their eradication we only require that thorough and hearty co-operation between the master and the medical man, the importance of which we shall enforce with all the vigour at our command.

CHAPTER I.

SCHOOL CONSTRUCTION, ETC.

THE first thing to consider, naturally, is the best ideal site for school buildings, and imagination must aid knowledge in presenting to the mind's eye a picture of abstract perfection from the view-point of sanitation and convenience. It is quite obvious that a very sharp line of demarcation must thus divide some of the older and more historical schools, from those which have been recently built, and that whilst the senior institutions are often hampered by the conditions under which they are necessarily *placed, their junior* competitors have no excuse for not

being, as they often are, models of all that can be required; for perhaps in no other direction has more satisfactory progress been made of late years than in the proper internal arrangement of dwelling-houses. In olden times, outside show was alone the object of ambition; and whilst architects vied with one another in the production of the artistic and picturesque, the unfortunate inhabitants were too often condemned to live in dark stuffy rooms, with break-neck stairs, and drains which seemed directly to invite the outbreak of disease. We have changed all that in these days; sanitary science has become so widely popularised, that no one of ordinary education will consent to lose his health in deference to the arrangements of a builder, and the blessings of good air and water are not only fully recognised, but thoroughly understood. Were any proposition now made to make profit out of the atmosphere by means of a window tax, we can imagine the general roar of indignation that would arise from high and low; and public opinion and the Press keep such a vigilant outlook for abuses, that any serious defects in a public building cannot long remain concealed. Dotheboys Hall no doubt was a correct, if highly-coloured sketch, of what actually took place forty or fifty years ago, but anything of the kind would be impossible in this age of enterprising newspapers, smart special correspondents, and vigilant medical officers of health charged with the

duties of inspection. As a natural consequence of the improvements we have indicated, the general standard of health has greatly improved in England, for not only are epidemics fewer and less destructive, but home life has become brighter and pleasanter, and childhood is undoubtedly passed under happier and more profitable conditions; for it is almost impossible to exaggerate the damage necessarily done by the dark, close, and overheated rooms, in which our juvenile population of former years were compelled to climb the steep and slippery steps leading to the temple of knowledge.

In considering the precise situation on which a school ought to be placed, we must summon general principles to our aid, and follow the teaching of those rules which would guide the selection of a dwelling for ourselves. A southern exposure, a moderate elevation, and a gravelly soil, naturally occur to the mind as primary requisites, and a pure, dry, but not uncomfortably keen air would also be chosen. It is of course desirable for many purposes of convenience that the school should be moderately near a town, but still sufficiently far off to minimise the drawbacks and temptations inseparably attendant on city life. Some existing institutions have had their sites fixed by the instructions of their founders, as well as consecrated by the associations of antiquity, and cannot *move even if they* would; many of them, however, by

means of intelligently and liberally planned alterations, are keeping themselves fully abreast of the progress of the times; whilst others, which had been hopelessly engulfed by the rapid growth of towns, have had the courage to tear up their roots, and transplant themselves to more congenial country soil.

Our ideal institution having thoroughly made up its mind where to go, will next proceed to cut its coat according to its cloth, and adapt its architectural style to the funds at its disposal. Whilst deprecating the waste of money on useless or unmeaning ornament, and the possibility of crippling real efficiency by reckless extravagance on outside effect, there can be no doubt that it is the duty of every one who builds at all, to devote as much attention as he can afford to tasteful and elegant construction. As a natural reaction from the way in which comfort was formerly sacrificed to architectural ambition, the idea became prevalent that an ugly exterior was alone compatible with convenience within, and under the influence of this vulgar error some of the most hideous erections that a diseased imagination could conceive, were planted throughout England. We now know that not only economy, but a perfectly well-arranged ground plan, may harmoniously agree with a picturesque elevation; and Mr. Norman Shaw, in particular, has done a real service in showing that cheapness does not neces-

sarily exclude beauty. It is, perhaps, not too much to hope that the time may come when the depressing influence of dreary ugliness will be banished from our streets, and that young as well as old will be brought up among things which are rightly as well as elegantly proportioned. To fill the eye at every turn with something of grace and dignity is to give an early inclination towards that refinement which years of more pretentious culture may afterwards fail to impart; and it is therefore to be advised that school buildings should be made as handsome as possible, and that boys should stimulate their affectionate recollections of the old place by the pride with which they can look at it even in adult life.

It must, of course, be left for the architect to decide in what style the school is to be built, and of course all the outside details must necessarily be settled by him. But when it comes to the internal arrangements, the headmaster will naturally make his wishes known, and it will be well to add to the consultation a medical man of experience, who can advise on sanitary points.

The dormitories must be light and airy, allowing at least 1000, but preferably 1200 cubic feet per head; and when practicable, it is both comfortable and convenient to divide them into little stalls or cubicles, about five feet high, and sufficiently large to contain not only the bed *but a tub,* washhand-stand, and chest of drawers. In this

way boys may enjoy all the advantages of privacy without being entirely withdrawn from occasional supervision.

Much discussion has been expended on the comparative merits of various systems of ventilation, and we should be inclined to recommend that by Tobin's tubes, combined with Galton's fire-grates, which ensure a thorough warming of the external air. It is of great importance that the ventilation openings should, if possible, be so placed as to be out of reach, as boys are not naturally enthusiastic about fresh air, and will try to stop any apparatus which seems to encourage draughts. When sanitary science and elementary physiology become necessary ingredients of knowledge, every one will learn how important a part atmospheric freshness plays in the maintenance of health, and how essential it is that during the growing and developing period of life all physical conditions should be carefully considered and arranged. The medical officer should be encouraged to give an occasional lecture on these important points, and to show that plenty of oxygen, and ample breathing space by night and day, and cold bathing and other hygienic means, may really turn the scale of difference between a good constitution and a bad in after life, between the enjoyment of a healthful and useful career, and the depressing consciousness of enfeebled powers and deficient nervous energy.

Another controverted point is the advantage or disadvantage of separate houses, and the so-called hostel system, where all the boys are assembled under one roof. We should ourselves prefer the first plan, not only because less encouragement is thus given to the spread of epidemics, but because separate masters may introduce more of individual and domestic supervision among the pupils assembled as one large family under their roof; and of course the size of the bedrooms will vary according to taste and circumstances; it being advisable, however, not to have more than from ten to fourteen in one dormitory, a larger number being apt to increase the occasional risk of the communication of disease. The dining-hall is also regulated in size by convenience, and may contain from thirty to seventy; and taste and liberality frequently find scope in the decoration of roof and walls, and in the objects of art hung up around. An excellent practice exists in many of our public schools, of the house-master and his family partaking of their dinner along with the boys, and thus not only encouraging a good standard of manners and demeanour, but checking that tendency to grumble at his food which is not entirely confined to the adult; for a lad can hardly complain of his roast beef or mutton when he sees his superiors in age and experience calmly feeding off the *same joint*.

Coming now to the actual class-rooms, it is self-evident that faults in their construction must do infinite and varied harm. Bad air is especially injurious when brainwork is going on, and headache, depression, ill-temper and dyspepsia, both in master and pupil, are only some of the symptoms of that chronic carbonic acid poisoning which used to be the rule rather than the exception in our schools. At least 600 cubic feet, as laid down by the Education Code, should be provided per head, and a good system of ventilation will ensure that the air is renewed so efficiently that 3000 cubic feet for each occupant should pass through the room every hour.

Whenever boys' attention begins notably to flag; when they seem to grow dull and stupid and careless, and when yawning becomes general, then it may be fairly assumed that the air is becoming impure, and that some change must be made. Gas plays an important part in destroying the purity of the atmosphere, and arrangements must be made for carrying off the products of its combustion as rapidly as possible. It is highly probable, however, that in the future it may be superseded by the cleaner and brighter inflammable vapour of kerosine, or that the electric light may be made readily available for domestic use. Another fertile source of discomfort on the Continent occurs in connection with iron stoves, which give off various unwholesome gases, and appear to be

responsible in schools for headache, giddiness, and other uncomfortable symptoms. Large open fireplaces, therefore, if more expensive, are not only more cheerful, but aid ventilation, and improve rather than destroy the purity of the air. Space and light and freshness, then, are primary requisites in order that the mental powers may work vigorously under the stimulus of duly oxygenated blood; and to this we must add quietness, not only from the absence of outside crash and din, but from good acoustic arrangements, enabling the voice to be readily heard without shouting and strain. And to prevent those sonorous vibrations following every footfall or accidental noise, it is well that the floor should be covered with some clean and elastic material, such as kamptulicon or matting.

In addition to these more general rules, two special points remain for consideration. It has been pointed out by Liebreich,* that short sight and spinal curvature are often produced by faulty arrangement of light and seats; and his views are so important, in their bearing on the physiology of education, that no apology is necessary for entering into them in some little detail.

He shows that three changes in the functions of the visual organ are immediately developed under the influ-

* "School Life in its Influence on Sight and Figure." Two *lectures by R. Liebreich.*

ence of school life; the first of these, short sight, being almost exclusively so, being much more common in schools where unfavourable optical conditions prevail, and although often hereditary, the predisposition may be alleviated by judicious treatment. The second, amblyopia, or a decrease in the acuteness of vision, is often produced by unsuitable arrangements for work; and the third, asthenopia, or decrease of endurance, the most frequent and serious of all, is, like the other two, usually produced by "insufficient or ill-arranged light, or from a wrong position during work." Under these conditions we are obliged to lessen the distance between the eye and the book while reading or writing, and we must do the same if the desks and seats are not in the right position, or of the right shape and size, "When the eye looks at a very near object, the accommodating apparatus and the muscles which turn the eye, so that the axes converge towards the same object, are brought into a condition of greater tension, and this is to be considered as the principal cause of short-sightedness and its increase. If the muscles of the eye are not strong enough to resist such tension for any length of time, one of the eyes is left to itself; and whilst one eye is being directed to the object, the other deviates outwardly, the images which fall upon it are no longer attended to, and its sensibility becomes blunted or amblyopic. Or perhaps

the muscles resist these difficulties for a time, becom uneasy, and thus is produced the diminution of e durance.

"How can these evils be prevented? The light must b sufficiently strong, and must fall on the table from th left-hand side, and, as far as possible, from above. Th children ought to sit straight, and not have the boo nearer to the eye than ten inches at the least. Beside this, the book ought to be raised 20° for writing, an about 40° for reading. The proper light is most easil obtained if the class-room is of an oblong shape; th windows being in one of the long sides, and the table arranged parallel to the short walls, so that the light fal from the left hand. The desk of the master ought to b placed near the short wall, towards which the schola look."

He goes on to tell us how rarely these simple rules a practically recognised: how some school-rooms are lighte from the right, so that the hand inevitably throws a heav shadow on the paper; that others have low broad windo on three sides at once, rendering any suitable position the desks an impossibility; whilst the Education Depar ment enjoins the most injurious arrangement of all, b ordering, in Rule 15, that "the windows should be s placed that a full light should fall upon the faces both *the teachers* and of the child." Now light from behin

s bad, because the head and upper part of the body throw . shadow on the book, but that from the front is far the vorst, because it not only fails to attain the object desired, ut is most hurtful to the eye. The moral therefore, is, hat we should look sharply after our architect, and see hat no ambitious views of picturesque effect, or artistic recision, interfere with the efficiency of our building for ts actual function of enabling education to be carried on vith comfort, safety, and efficiency.

Coming to school seats, Liebreich shows that their aulty construction must clearly be held responsible for a ariety of ailments due to the crooked and stooping posi- ion which children are sometimes almost compelled to ssume. Short sight, and fatigue of the accommodation pparatus of the eye, are due to want of proper inclination f the desks; curvature of the spine arises from want of roper backs, and the sprawling and contorted position ncouraged by too great a distance between the seat and he desk, disproportion between the height of the seat and hat of the desk, and wrong form and shape of the desk.

Space will not allow us to enter into the interesting nd conclusive anatomical and physiological detail by vhich Liebreich proves his case; but the following ropositions from his lecture will form a sufficient umming up, and will conclude this branch of our ubject:—

1. "One and the same size and model of desk shou used for children and grown-up persons of sexes.
2. "The adaptation to the height of each child s be effected by varying the height of the seat an foot-board.
3. "The edge of the table is always to be perpendi to that of the seat.
4. "No seat is to be without a back, and the top o is always to be one inch lower than the edge c table for boys, and one inch higher than the ed the table for girls.
5. "In all classes where the boys change places height of the seat is to be regulated in proporti the average height of the pupils.
6. "In all girls' schools; in all those boys' schools v places are not changed; in boarding-schools, a private school-rooms, the seat of each child sl be accurately regulated in proportion to its hei

In addition to the school-rooms proper, studie usually provided in the better appointed institutio which either singly, or more commonly in pairs, may carry on their work free from noise and interru Occasionally these contain beds, but this arrangeme *indefensible* on many grounds, and it is far better

the sleeping accommodation should be entirely separate from that which is devoted to any other purpose.

On other points sanitary science will lay down regulations which need not differ from those in ordinary use, but although it is a mere truism to say that a pure and abundant water-supply and well-constructed drains are essential for health, we must again lay down the necessity for the careful supervision of architects and builders, who are too apt to be culpably negligent in these important points. And in connection with schools placed in or near large towns, the dangers of this vicinity must not be forgotten, and more especially the risk of the communication of infectious disease. If possible, a totally distinct source of water-supply should be provided, but if that be impracticable, every care should be taken to ensure entire disconnection with the neighbouring sewage, and the thorough trapping and ventilation of the adjoining town drains. In order more decidedly to insist on this it is most important that the school should, if possible, be represented on the local board by the head master.

Another advisable precaution is that of a separate laundry. Where clothes are washed in common, even the greatest care will not prevent scarlet fever, more especally, from being spread in this way, and a chain of communication thus established with districts whose sanitary conditions predispose them to propagate disease.

For reasons, then, both of convenience and health, it is most desirable that schools should be placed at some distance from a town, an additional argument being that under these circumstances it will be much easier to provide those spacious grounds for recreation which are now justly looked upon rather as necessities than luxuries. The size and arrangements of these naturally depend both on means and opportunity, and in another section we will consider in some detail the subject of play in relation to health.

Dr. Fergus of Marlborough, whose long experience and special devotion to the study of school hygiene entitle his opinions to the highest respect, has favoured me with the following remarks, which are so practical and judicious that no apology can be needed for their introduction:—

"The site of a school ought to be chosen with great care. Low or damp localities should be avoided. A gentle slope without high ground at the back, or an elevated plateau, are the best situations for school buildings. The character of the soil is of great importance; a porous soil, promoting rapid drying after the rain, and the avoidance of pools of stagnant water or persistent mud, should be sought for.

"The foundations of the buildings ought to be laid with regard to the non-absorption of moisture; provision

for the passage of drains should be made while the foundations are being put in; a complete plan of the drains and of their destination should be made before the building is commenced. The walls should be solidly and well put together with mortar made with clean water. An air space, of about 3 inches in width, left in the thickness of the walls conduces much to the dryness and warmth of the house. Well-made concrete is a much drier and less absorbent material for walls than either brick or stone. The building ought not to be on too large a scale; several blocks of building, with ample space between, are much better than one extensive erection.

"The windows should be so placed as to throw light upon the work that has to be carried on in the room. For ventilation, the nearer they are to the ceiling the better. Very many of the systems of ventilation are failures. Every room should have the windows and doors so placed that a complete flushing of the room may be effected at any time. Tobin's tubes, placed in the corners of rooms, are useful in supplying air. Good fire-places are the very best sources of warmth for moderately-sized rooms. The Boston fire-place and grate is very successful in warming a room with small consumption of fuel. Where large halls or rooms have to be heated, hot-water pipes, or Gurney's stove, furnish large volumes of heated air. Hot-water pipes require a

great deal of care, and are apt to fail by being frozen at the very time when they are most required.

"The water supply of a school is a matter of the utmost importance; there should be no limit to the supply, whether for domestic or for other uses, such as flushing drains and supply of water-closets. Water is best from deep wells, care being taken to keep all drains, latrines, &c., at a great distance from the well. The water should be kept in the mains at full pressure; every water-closet should have its own cistern, from whence it would be impossible to draw water for any purpose whatever. It is always better for a school to have its water supply, and if possible its system of drainage, independent of every other authority.

"The drains ought to have free ventilation, and every means ought to be used to prevent the formation of sewer gas, and to prevent its ever being either generated or existing with anything approaching to pressure upon its elasticity. A regular supply of disinfectants to every drain and water-closet, with regular flushing of the sewers with a full body of water, is the best guarantee against the generation of poisonous gases.

"In dormitories from 1000 to 1200 cubic feet should be a minimum quantity of air allowed to each bed, with a floor space of at least 60 square feet. In lofty rooms *a large amount* of cubical space may concur with much

too small an allowance of square space on the floor. The windows should be made to open easily and be close to the ceiling. Such windows are preferable to casements. There should be at least one fire-place in each room. The ventilation ought to be systematically arranged so that a supply of air and an exit for its withdrawal should be in constant action. The beds in every dormitory should be opened, and the bedclothes turned back for several hours every morning, and the night-dresses thoroughly aired at the same time.

"The space in class-rooms, provided the ventilation is good, might be roughly taken at about one-half the amount allowed in dormitories. All windows should be left open whenever the rooms are empty and not in use. The light in class-rooms ought to be good, and so arranged that it may fall upon the work and not strike the face of the pupil. No class ought to be kept sitting for more than an hour at a time, and a movement of every boy in the class should if possible take place during the hour."

CHAPTER II.

ON SCHOOL WORK.

THE physical effects of education have been discussed very widely, and from many points of view; and whilst

some predict all sorts of evils from over-work, others are disinclined to believe that such a condition ever exists under favourable physiological conditions. In this, as in so many controversies, there is at least a modicum of truth on either side. The training of the mind is essentially an artificial process, and many children to a large extent resent the intrusion which it implies into their freedom and the careless happiness of their earlier years; and although when the first dry rudiments are mastered some rush eagerly through the gateways which lead to the enchanted realms of knowledge, others would be only too glad to remain behind in that ignorance which to them is bliss. Thus it is, therefore, that dangers may lurk in the path of the teacher who has to unfold and spur on the sluggish brain of the idle and stupid, whilst he must at the same time repress the energetic workings of some minds which would only too eagerly yield themselves to the fascinations of learning. But although education in its earlier stages must be called an unphysiological process, and although its development throughout school life must be watched with care, I personally hold that no reasonable amount of work will hurt either boy or girl who gets plenty of good food, and sleep, and play. When the excitement of competition and examination is succeeded by the inevitable reaction, a few *wakeful nights* may be spent, but the youthful tempera-

ment is hopeful and elastic, and the discomfort of defeat or failure does not press either heavily or permanently during the teens. The schoolboy naturally does not feel, like the undergraduate or professional student, that even partial success may really mean shipwreck of his career, and that a brilliant victory may be dearly bought at the expense of a shattered nervous system, or permanently weakened digestion. And again, he cannot know those dark days when domestic cares begin to exert their insidious influences—when the support of wife and children seems to fade away into a gloomy and uncertain future—when business goes wrong, and when clients and patients will not appear, and when anxiety and worry, the real potent factors in what is popularly called over-work, come into effective play; for then we hear of the sudden breakdown, the mental crash or intellectual bankruptcy, which although terrible from its apparent suddenness, might really have been foreseen by any careful and skilful observer of the particular case. But the happy-go-lucky buoyant temperament of early life will not long retain any painful feelings of depression. The fresh and joyous spirits quickly recover with a bound. A goal at football will chase away the dreary recollection of a badly made copy of verses; a good innings at cricket will prove an excellent antidote to most school troubles. And it is well that such is the case, for what with entrance exami-

nations and superannuations, and university preliminary ordeals, and competition and cramming at every turn, the life of the little boy has become so perilously like that of the struggling man that grave evils must result were not the safeguards against strain so many and effective. My own convictions on this point have not been formed without some opportunities for observation. During nearly three years I had the honour to hold the post of medical officer to Rugby School, and during that period, out of a total of five hundred boys, only two well-marked cases of damage from over-work came under my notice. In one of these the boy had been preparing for a particular examination, had sat up late at night, and slept badly, and something like what used to be called brain fever was the result. The other lad was specially desirous of distinction both in and out of doors; the heavy double strain of maintaining a foremost place in work and play, was too much for his nervous energy, and a temporary breakdown was the result. These two instances of damage from over-wrought cerebral centres were entirely exceptional, and save an occasional headache or passing feeling of *malaise*, the large number of boys suffered no inconvenience from the very considerable amount of work which they were called upon to do. All physical conditions, however, were favourable; the *lads were well* housed and fed; they got plenty of

vigorous recreation, and ample holidays; everything was cheerful around them, and they liked both their work and their play. And although an attempt has been made to show that the smaller boys in preparatory schools are often damaged by the pressure of competitive work, I must say, that having also been in medical charge of several of these institutions, no instance of loss of health from over-work was ever brought under my notice. I have thought it necessary to be very decided in my expression of opinion on these points, not only because of their extreme interest and importance, but because erroneous views are often dogmatically given out by those who reason purely from abstract principles or analogy. We frequently see, say they, the disastrous consequences of mental strain in adult life: are they not, therefore, much more likely to occur in the undeveloped and rapidly growing constitutions of the young, and is it not our duty to raise a solemn protest against the continuance of such hurtful errors? Certainly, if they can be proved to exist; but appealing both to the physiology and psychology, if we may use such an expression, of boys, and to our own experience, we must repeat that the dangers of over-work among them have been very gravely exaggerated, and I may state that Dr. Fergus of Marlborough, and Dr. Dukes of Rugby, who are enabled to speak with the authority of long and well-

matured experience and observation are, in substantial agreement with my views.

But it may fairly be argued—Agreed that although under the perfect physiological conditions which you describe, over-work is of exceptional occurrence, a large part of the community must necessarily be forced to pick up their education under less favourable arrangements; and is not serious damage often done to them? Of course, if Nature's laws are broken, the penalty must be paid; and here, as elsewhere, the punishment falls on the innocent victims of the ignorance of those in authority, rather than on the real culprits. But we can fall back once more with confidence on the argument, that the happy elasticity of the young mind preserves it from risks which would really prove perilous to older brains, and I doubt whether even among the less favourable arrangements of the cheaper forms of education much harm is often done.

Day-schools would seem, theoretically at least, more apt to encourage discomfort from overwork, because in them the hours are often longer and more continuous; the play facilities are not so good, and home arrangements may err on the side of irregular or insufficient feeding, and unnatural curtailment of sleep from undue zeal and anxiety at evening preparation. And here we must point to the evils which undoubtedly do arise *among some of those* unfortunately-situated classes of the

community, among whom the blessings of education are now lavishly if somewhat harshly distributed. The badly nourished and badly clothed children of the very poor are suddenly reclaimed from unhealthy idling and sent to school, and their bloodless brains are compelled to bear the strain of work which is occasionally trying even to the vigorous and well fed. Their lessons must be learnt amidst the dirt and noise and cramped space of what it is almost a mockery to call a home, and their sleep is too often disturbed by worrying over the tasks of which, strange to say, they are usually very fond. Can we wonder that under these trying surroundings they often suffer from headache and languor and depression and insomnia, and that the medical officers in charge of the out-patient departments of hospitals should be very frequently consulted for symptoms attributed to the pressure of study? Making all allowance for the exaggeration of parents, who are too willing to lay upon schools and school boards the responsibility which should really be placed on their own shoulders, we are compelled to admit that damage is often done, and in particular we have observed that chorea not uncommonly results from the strain of the rigid routine of school work on "movable" and badly nourished nervous systems. Perhaps at some future time provision may be made for medical inspection of our board schools, and more latitude may be

allowed to teachers, both in the way of lessening and altering the distribution of work in particular cases, and of allowing weaker children to attend for only an hour or two in the day. It is of course quite obvious that a great deal of latitude must be left to teachers who are not compelled to follow the rigid code of the education department, and that their common sense and sagacity can be thoroughly trusted to lay down efficient programmes for the instruction of the young. But here, as elsewhere, we have to insist on the enormous importance of the master and the doctor working together constantly and harmoniously hand-in-hand. Experience and reflection will soon familiarise the former with the different natures and aptitudes of boys, with their special tastes and talents, and will enable him to detect the earliest symptoms of mental strain, and hand the sufferer over to the diagnostic skill of his colleague. And the medical man too must keep his eyes open, and be ready from time to time to tell the unpalatable truth that some boys are constitutionally unfit for public school life, and that the education of others must be conducted with caution and care if it can be attempted at all in any formal fashion.

As an evidence of progress in the physiological consideration of the routine of mental discipline, we may *mention the fuller* recognition of the great importance of

a variety of work. Instead of the monotonous and unvaried round of classics, with the compulsory construction of Latin verses by those who often had no real aptitude for the task, but who knew enough to see the hopelessness of their attempts to imitate the great masters of antiquity, modern languages and science now take their rightful place in the curriculum, and the fatigue from one subject is most effectually counteracted by passing on to another. Music and drawing can also be readily fitted in without displacing really important things, and should be taught up to a certain point to all; and by this judicious mixture of the old and the new, and of theoretical and practical work, the freshness and vigour of the attention and memory may best be sustained, and pupils enabled to take a vivid and permanent interest in their studies. For whilst some lads are really fond of classics, others rebel at the entire absorption of their time in things which may have no immediate bearing on their future career; and the establishment of modern sides has been of vast importance, as supplying the honest desire of many for practical work without entirely depriving them of the mental training which is supposed so specially to belong to the dead languages.

COMPETITION.

In girls' schools we have many theoretical risks. The female temperament is more nervous and anxious and excitable than the male; their bodily frames are undoubtedly weaker, and their opportunities for throwing off work by vigorous muscular exertion are few and far between. The style of work adopted in their schools is often less interesting and tonic to the mental faculties, partly because the stimulus of competition is absent, and because in most cases they are unable to feel that any part of their studies beyond mere showy accomplishments has any real bearing upon their future career.

Unless they love learning for its own sake, as they grow older, they are impatient to get out of leading strings, and enter that world of fashion and pleasure into which they have only as yet enjoyed stray peeps, and into the supposed mysteries of which novels and the highly-tinted descriptions of their more experienced school-fellows have partly initiated them. Under these circumstances work naturally becomes a bore, and when pressed on they mope and fret, and loss of health follows; so that both among this class and among those whose really studious natures induce them to overtax their *anæmic brains*, there may be evidences of overwork

But here, also, I believe there has been much exaggeration; for in no department of education have greater improvements been introduced than into girls' schools, and in some of the largest of these which we have had an opportunity of inspecting, we found that, although the standard of work was high, the standard of health kept at the same elevation; that the girls looked bright and cheery and vigorous, and that inquiry could not elicit any evidence of injury from overwork. We must remember that a healthy enthusiasm is now stimulated among girls by the wider opportunities which are afforded them by a more thorough and systematic scheme of education, by University examinations, by their employment in many useful and interesting pursuits, and by the fact that even the professions are now beginning to throw open their portals for admission; and the more varied and full of hope their work is, in due proportion will diminish those risks which cannot be overlooked as not unlikely to occur under the comparatively unfavourable conditions which fashion formerly imposed upon the education of girls.

The evils of competition, both to body and mind, have been eloquently exposed by a variety of authors, and it is impossible to look without anxiety on a system which exposes the brain to those conditions of extreme tension and subsequent relaxation which can hardly be

continued without danger. We have already expressed an opinion that during boyhood little harm is likely to arise; but when young men are struggling for a prize which is not only the object of just ambition, but on the attainment of which depends their own future and the reward of parental care and perhaps hard-earned expenditure, the elements of worry and anxiety come into play, and whilst failure may be absolutely crushing, success may be damped by the consciousness of permanently enfeebled powers. The vigorous cramming by which a mass of uncongenial and ill-digested information is rapidly forced into a more or less distensible brain must necessarily damage the less elastic minds and memories in greater or less degree, and all the more so because the process is usually carried on under unhealthy conditions in large towns, and without the relaxing process of athletic exercise. Impressed with these evils the head-masters of our large public schools are now laying themselves out to prepare their pupils for the principal competitive examinations, and to compete with those crammers who have been so successful in placing their pupils in prominent places in the list of honours, and we are sure that their efforts, when thoroughly organised, must eventually be rewarded with entire success. A great stimulus will be given to the interest of education *when boys feel* that they are directly preparing for a

promised appointment, or for the struggle which may place a life-long provision at their command.

And teacher and doctor being both fully aware of the evils which may result from anxiety and worry re-acting on the real pressure of work at such times, will cordially co-operate in their endeavours to see that neither success nor failure will leave any permanently bad effects on the youthful mind.

How much work should children be allowed to do? is a natural question; and probably six hours on whole school days, and four on half holidays, is a sufficient tax on the young and growing brain, to which some addition may safely be made before examination time. In day-schools it is found that four hours' continuous application is enough, and it is desirable that even this continuity should be broken up by an occasional few minutes of play, or some change of air from room to room.

A word on punishment may not be deemed out of place. If corporal chastisement is really necessary, it should be conducted with much consideration and ceremony, and with a rarity which will make it thoroughly impressive; and the regulation of our larger schools, that it should only be inflicted by the head master in person, is a good one. Attention has occasionally been drawn to serious and even fatal accidents following the unregulated use of flogging when passion unfortunately over-

masters reason, and meningitis has followed a blow on the head, and the *membrana tympani* been ruptured by a box on the ear. It is no part of our duty to lay down the sort of offences which call for the use of the birch or strap, but we may point out to educational authorities the importance of bearing in mind, that stupidity, or peculiarity of manner, or apparent sullenness, or disrespect, may be due to physical causes, to bad air, or insufficient food, or incipient brain disease, or bad sight, and that medical treatment, rather than harsh discipline, may be required.

Discipline of course demands that there should be some means of checking wilful and repeated infringement of school law, and the necessity for this will arise with greater or less frequency, according to the character of the head-master, and the awe and respect in which his authority is held. It is no part of our duty to suggest any details for the regulation of punishment; but we are bound to condemn anything which may do physical harm, such as locking up little boys in dark rooms, reducing the dietary, or compelling the culprit to write out so many hundred lines in a given time. The last of these being a very fashionable mode of correction, we enter our protest against it on two grounds; first, the *injurious* effects of such cramped and hasty scribbling on *the handwriting;* and second, the damage done to sight

by straining the eyes in bad light and under depressing conditions.

We must not conclude this chapter without a remark on sleep. The active and vascular brain, containing as it does a very large mass of blood, must have a good allowance of rest for the purpose of repair, and, during childhood, of growth. The young should be encouraged to take a good allowance of Nature's sweet restorer, and for school-boys from 8½ to 9½ hours, according to age, is not too much; lights being put out at 10 o'clock, and the inhabitants of the dormitories recalled to activity at 6.30.

Want of sleep in the young is a purely morbid process, and demands the immediate attention of the medical attendant, who will prescribe what is necessary to meet the requirements of any particular case.

CHAPTER III.

SCHOOL PLAY.

THE word play naturally follows work, or rather goes side by side; for a recollection of the familiar proverb is hardly necessary to tell us that the latter, unrelieved by the former, turns out but a dull boy. In another volume*

* Health Primer. "Exercise and Training."

the subject of exercise and training is carefully and elaborately discussed from the anatomical and physiological standpoint, and all that is left for us is to furnish some very general observations on athletic sports in their bearing on health in schools. And here, again, we have to express our dissent from the confidently-expressed statement of public opinion that games are now too much cultivated in our public schools, and that not only is mental too often sacrificed to physical training, but that positive damage is inflicted on the tender frames of the young by overstrain or actual accident. The fond mother, when she witnesses with timid eyes the wild dash and struggle of a football scrimmage, probably registers a mental vow that none of her children shall be exposed to such perils; and the father, as he pays his quarterly bills, expends many a good grumble over the greater enthusiasm of his sons for football and cricket than for Homer and Horace. Whilst fully understanding how these views arise, we can give them neither sympathy nor support, convinced as we are that they are founded on imperfect knowledge. For in order that the brain should do its work healthily and well, it is above all things necessary that it should be supplied with pure and abundant blood, and such good blood-supply comes not only from wholesome and well-digested food, but *from thorough* aeration by vigorously-acting lungs; and

efficient distribution implies that the heart and machinery of circulation are also in efficient discharge of their duties. Exercise expands the lungs, increases their vital capacity, and by making the respiratory movements deeper and more complete, removes stagnating air, and sends oxygen deep down into the residual cells. The heart, like other muscles, improves under such discipline in quality and in tone, a healthy action of the skin is encouraged, the labour of other organs lightened in their task of removing effete products from the blood, and that highest of all conditions established, in which there is a rapid destruction and reconstruction of the tissues of the body. And then we see in the clear bright eye, fresh colour, and firmly developed frame of the trained athlete, that the machinery of life is equal to all reasonable demands which may be made upon it. Of course it is a mere truism to say that here, as elsewhere, we must guard against excess, and avoid turning out such types as the flesh-encumbered body of the pugilist, or the unnaturally wasted muscles of the book-worm, who could hardly run a hundred yards to save his life, and would pay for a few turns on a horizontal bar by prolonged stiffness and discomfort.

Games, like work, must be carefully regulated; special limits must be allotted for their indulgence, and a healthy spirit of emulation encouraged out of as well as in doors;

and it is certainly a wise regulation in public schools which compels all boys, not physically incapacitated, to take part in active exercise of some kind. Without this, some of the more dreamy-natured would merely mope and moon about during play-hours, feeling perhaps a little fagged with their work, and dreading the trifling exercise of will necessary to prompt the actual exertion which will send them back to the class-room ready for their books again. It may safely be left to the heads of houses to decide in what way this compulsion may best be applied; but as most large schools now have attached gymnasia, this is an excellent field for safe and enjoyable exercise, and a special regulation may ordain that each boy should spend so many hours a week there, under careful and methodical supervision. Here, again, it is of the highest importance that the teacher and doctor should go hand-in-hand, and that a careful physical examination should be made of every boy before he is permitted to enter the more violent arena of athletics, and more especially a sharp look-out should be kept lest any symptoms of strain become developed.

These dangers, however, have been looked upon by some as of considerably real importance, because of greater frequency than we are disposed to admit, and both ingenious and sensational arguments have been adduced *to show that* the encouragement of athletics in our public

schools must be held responsible for much of the undoubted increase of heart disease in later years. Let us examine these arguments in some little detail.

We know very well that the due and proper exercise of a muscle up to a certain point is beneficial; but that if it is carried beyond the stage at which nutrition can compensate for loss, or if constitutional enfeeblement or want of sufficient nourishment coincide, wasting and atrophy surely supervene. An excellent illustration of this may be derived from the file-cutters of Sheffield, who are only able to continue their specially hard work during a few years, in consequence of the originally hypertrophied biceps eventually dwindling down so far as to be almost useless for effective movement. We are also all familiar with the recorded cases in which during violent exertion one of the cardiac valves gives way, and the victim is condemned to a future life of feebleness and suffering; and I have myself met with a few cases in which temporary dilatation of the heart undoubtedly followed some continuance of active effort.

Strain of any duration, as originally pointed out by Virchow, has a very considerable influence in the causation of valvular disease of the heart, and ample confirmation of this is given by the greater frequency of this form of disablement both in the army and navy, and among those of the civil population who have to live

by violent exertion, than among those who are enabled to pursue a more sedentary life. Such, then, being undoubted facts that heart disease is largely on the increase, and that strain is a frequent factor, the inference might seem a reasonable one, that athletics at our public schools and universities must stand condemned in a serious responsibility. But, on reflection, it is evident that such cases of injury are enormously few in proportion to the supposed exciting cause, and that many of them affect subjects predisposed to danger by arterial degeneration or general constitutional debility. The Cornish miners, who suffer from palpitation and dyspnœa, followed later by organic heart disease, undoubtedly caused by the prolonged climb of nearly an hour up the ladders which lead from the pits, are invariably exhausted by hard work and bad air and hunger before they start for home; and all the single cases of strain I have met with occurred in boys either weak from rapid growth or other causes, or who also were expending large quantities of nervous energy on their school work, the force of the heart being weakened and accelerated by exhaustion of the vagi. Thus we are justified in laying down the real importance of an even earlier, more universal and systematic muscular training than is now recognised. The possessor of a weak or fatty heart is in perpetual peril if he has *occasion to run* a few yards or make any sudden exertion,

and fatal syncope may be the result; and the best means to guard against this are to be found in gradual, cautious, and scientific development of the bodily powers, by various exercises specially designed for that purpose, and which will place the young man under those physical conditions best calculated to enable him to withstand the wear and tear, the worries and anxieties of his future life.

We therefore find that most boys are quite able to take their full share in all ordinary open-air amusements. and that paterfamilias need not grumble at the fine physical development of his sons, or at their proficiency in, or enthusiasm for, manly sports and exercises; and perhaps, when materfamilias hears how small the risk really is from the apparently rough games which fill her gentle spirit with dismay, she may relax somewhat of her determination to protect her children from dangers which formerly seemed to be both inevitable and unnecessary. And more especially she will, perhaps, be surprised to learn that even football, which seems to the inexperienced observer to be nearly as full of peril as a cavalry charge, is really responsible for very little beyond an occasional bruised shin or sprained ankle. Whilst at Rugby I preserved careful notes of every football accident occurring during my tenure of office, and was surprised to find how insignificant the total actually was. From time to

time some severe, perhaps fatal, casualty is reported, and the tide of public opinion begins to set in against the game, parental alarm being duly fed by the solemn warnings of the press and the dogmatic utterances of sentimental philanthropists. But it is clearly impossible for any sport to be indulged in without some trifling modicum of risk, and the zest and keenness of interest which are excited are often in proportion to the difficulties, and even dangers, which have to be surmounted. A scrap of orange-peel or a passing hansom cab may make a simple walk as perilous as the battle-field; and we must remember that the worst football accidents occur away from our public schools, and among young men who play with more unrestrained energy than boys, and at a time of life when injuries are more readily sustained, and less readily repaired. But, whilst fully convinced that the risks of this game are exaggerated, we must be none the less careful to obviate their occurrence, as far as possible, by careful supervision. It is important that both the head master and the school doctor should visit the playing-fields from time to time to check any irregular practices, and more especially to protest against hacking and scragging. In the first of these damage may be done to the tibia by the savage and purposeless kicking which used to be commonly practised, but which a more *healthy tone of* feeling has almost stamped out; and

scragging means the violent forcing of the head and neck forward during the "tight scrimmage." From this foolish and unnecessary practice we have seen one serious and nearly fatal accident.

Cricket can hardly be held responsible for many dangers, although when the practice-ground is very crowded it is hardly short of marvellous that more accidents do not occur from the balls, which fly in all directions with alarming velocity.

Boating is admirably adapted for bringing all the muscles into active and harmonious play, and it is satisfactory to know that the grave accusations brought against it have entirely broken down. The first note of danger was struck by the late Mr. Skey, some years ago, in a letter to the *Times*, in which he expressed his opinion very freely on the many risks attending this favourite amusement; but, greatly to the satisfaction of the public, Dr. Morgan entered the lists, and showed most conclusively, in his well-known work on University Oars, that the eminent surgeon's strictures were based both on ignorance and exaggeration. He tells us, that a careful inquiry made by him into the history of the 294 competitors who have taken part in the race since its foundation in 1829, proves the survival of 238 in good health; and that of the others, only three died from heart disease. The conclusion being that those who

wish to live long and vigorous lives had better take any opportunity afforded them of engaging, when young, in this variety of athletics.

It is hardly necessary to say that no boy should be allowed to enter a boat without having learnt to swim, which, in addition to its absolute necessity, is an excellent form of exercise. In schools unprovided with a convenient river, a good-sized swimming bath should, if possible, be furnished, the only caution being not to allow boys to remain in the water too long, as too continuous immersion has been found to produce congestion of the kidneys and temporary albuminaria. Gymnastics, although, on the one hand, they have the drawback of being conducted under cover, on the other enable exercise to be taken when rain renders outdoor sports impossible, and the greater variety provided, from simple dumb-bell drill up to the most intricate evolutions on the horizontal bar, permit almost any constitution to venture on something of the kind. Is it necessary to repeat the caution concerning careful medical supervision, and to lay down the axiom that the special superintendent should invariably be present when anything is going on in the gymnasium? The form of active exercise about which most caution should be used is running, which may vary from the ordinary paper chase *up to a course of* from 8 to 10 miles, for which a special

prize is given, and success in which is an object of special emulation. The pitiable state of exhaustion in which boys reach the goal after such severe exertion, shows the strain made on the heart and lungs even of the healthy, and the necessity for a careful physical examination before a boy is allowed to do a thing for which he may be really quite unfit, and which may damage his constitution for life. The ordinary scamper across country, however, is an invigorating and health-giving exercise, and may often be indulged in at a time of year unfit for more elaborately organized games, the only caution being to compel the boys carefully to change their wet and dirty things, in a room specially set apart for the purpose.

On the subject of training it is necessary to make a few remarks, even at the risk of once more going over ground already most fully traversed by one of our colleagues; for perhaps in no other direction has so much ignorance prevailed, or have so many erroneous views been promulgated with scantily instructed yet dogmatic authority. The athletic training of former years was almost entirely entrusted to retired pugilists and oarsmen, who, however expert at their own speciality, were quite innocent of scientific knowledge, and had grafted on the good rules derived from empirical experience many wild theories of their own. For instance, the

daily supply of water was restricted to a quantity utterly insufficient to supply the wants of the system, and the unfortunate victim was compelled to endure all the horrors of thirst, because he was told that more than three pints per diem would increase the "internal fat." We now know that such teaching is as unsound as that which would lay down the special superiority of lean meat as an article of diet for those about to undergo violent physical exertion, in ignorance or forgetfulness of the fact, that the main source of energy which is apparent during muscular action must be looked for in the oxidation of non-nitrogenous substances. Training, then, must be conducted on ordinary common-sense principles, meaning as it does nothing more nor less than a condition of the soundest and keenest health, sustained by an observance of the laws which physiology has so distinctly laid down. Without going into anything like detail, we may advise a wholesome and varied dietary, into the composition of which fat, starch, and sugar must largely enter, and moistened by a quantity of fluid which may safely be left to individual discretion. Plenty of sleep is a necessary condition, and exercise of varying degrees of activity must be taken at regular intervals, and for periods of time carefully laid down; and it will be well for the medical officer to keep an eye on all *boys under training*, to correct any of those fantastic

theories of eating and drinking which their reading may have suggested, and to see that no one is beginning to "train off," or to suffer from any of those "explosions" which Dr. Dukes has described as the result of an excess of nitrogenized material. Under these carefully regulated restrictions, a condition of modified training may safely be recommended to all those who are still within the youthful or pre-degenerative period of life.

Girls are luckily now able to get something better in the way of exercise than the spiritless routine promenade two and two along some monotonous road, and although cricket and football are not considered ladylike accomplishments, it is found that they can hold their own in lawn tennis and gymnastics, and speedily become proficients in swimming. In one large and specially well-conducted school in the north of London, lessons are occasionally interrupted by excursions into an adjoining hall, where a variety of extension movements are carried on for five or ten minutes to brisk pianoforte music, and the blood is thus briskly circulated, greatly to the advantage of the brain.

To sum up, the theoretical and possible dangers of athletics are, that ambitious boys may take too much nervous energy out of their systems by striving for success both at school work and at cricket or football, and that destruction overbalancing repair, evil consequences may

ensue; that the heart under excessive exertion may undergo strain, and that a weak ventricle may be so permanently stretched as to lead to organic disease; or that dilatation and even aneurism of the aorta may ensue. Constitutionally damaged lungs may be injuriously overworked, and actual injuries may be inflicted by the unrestrained roughness of youthful impetuosity.

But we hope we have succeeded in showing that although these things *may* occur, they very seldom *do* in the elastic frames of the young, and that physical, no less than mental, training is necessary to construct the ideal machinery for long life—the sound mind in the sound body.

CHAPTER IV.

ON SCHOOL DIETARY.

THE principles of diet are now thoroughly understood, and science has drawn up complete tables of the amount of the various constituents of food necessary to sustain full health under varying conditions. Invaluable as this information is to the physiologist, and to those who have to provide for the economical and efficient rationing of *large bodies of* men, it is of course impossible for every *one to regulate his* own practice by the rigid precepts of

the laboratory, and we find that custom and experience form the best guides to what we should eat and drink. Some people are, unfortunately, underfed, and the excess of others, if uniformly distributed, might be sufficient to put the balance straight. Instinctive likes and dislikes will generally lead each one to choose for himself what is best adapted to the special circumstances of his own life, and thus we find that in the tropics a craving for fruit and vegetables is as regularly found as the irresistible tendency which makes even weak stomachs eagerly consume large quantities of oleaginous matter amid the arctic snows. In arranging a scheme of dietary for the young, we must remember that, in addition to repairing the daily loss of a frame rapidly wasting under the friction of constant use, we must supply the materials necessary for growth, salts and phosphorus for the bones, potash and nitrogen for the muscles, fat to evolve force and furnish the basis of cell nutrition, being only some of the demands made from day to day by the constitution of a rapidly developing boy or girl. If these drafts are not duly honoured we meet with a wide variety of evil results, ranging from rickets in early childhood to struma and phthisis and eye and skin diseases, and the development of diathetic conditions which might otherwise have been induced to lay dormant. Parents, then, have a right to expect that children removed from under their own care

to the direct superintendence of schoolmasters, should be well nourished, not on extravagant luxuries, but on solid, substantial food, good of its kind, well cooked, and served up in a way which will assist the indications of appetite. There can be no doubt that in former years boys were habitually underfed, and that now the pendulum is tending to swing somewhat in the opposite direction at some preparatory schools, luxury having advanced to such a pitch as to make the youthful sybarite despise the more homely fare of the domestic circle. It is important to avoid these two extremes.

The question may naturally arise, how far in our dealings with the young we should carry out the principle previously enunciated, of letting their likes and dislikes come fully into play. Should we enforce the rule of some rigid disciplinarians, and make a child who hates fat clear up every morsel from his plate, we shall probably find in the end that we have gone against an instinctively-indicated direction of Nature, and that digestive derangements will be the result of our tyranny. In place of compelling him to eat what he does not like, and probably cannot assimilate, our ingenuity should rather be stimulated to supply him with the fat which he needs in some other way. Bacon is an excellent and invariably popular form, and is an admirable food for *those who are doing* brain work. Brunton says: "I

myself, after a trial of various things, have come to the conclusion that fat bacon is one of the most satisfactory things on which to do hard mental work, and I invariably take it for breakfast, when I have first to see a number of patients and afterwards to deliver a lecture."*

Sugar is of real importance as an article of diet, and should invariably be included in the meals, for the old notion of its decaying the teeth is entirely without foundation. We therefore see that the crowded confectioner's shop may really be another indication of Nature's wants, and the special demand of boys for pastry and ices, which grown-up people often condemn as unwholesome, because they cannot digest them themselves, ought to make their masters seriously consider whether a system of dietary, which leaves these particular wants so entirely unsatisfied, does not need reformation in that respect. It is, however, abundantly evident that much harm is done by the too frequent visits of boys to the confectioner, and the interference with regular meals which this involves. Dr. Dukes makes the practical suggestion that these establishments should be closed until 3 P.M., so that boys' dinners should not be spoilt by the trash which they too often consume as long as their money lasts. But, of course, the more unvaried the ordinary

* "On the Use and Administration of Fat." Practitioner, vol. xx., 1878.

diet, the greater will be the craving for unwholesome delicacies, and the ingenuity of cooks may well be expended in supplying some things, from time to time, outside the unvarying routine of joints and puddings. Of course we do not mean to imply that strict attention should be paid to all the vagaries of the youthful appetite, but boys, like every one else, whilst not wishing a continual round of stimulating luxuries, prefer to have their food appetising and properly prepared, and most especially resent that monotony which, happily, is yearly becoming less characteristic of our national fare. Coming now a little more to detail, supposing that public-school boys rise at 6.30 or 7 o'clock, it is clearly undesirable that they should begin work on an empty stomach. First lesson begins, say, at 7 or 7.30, and before this some light nourishment should be taken, consisting of coffee, or a cup of milk and a biscuit, and this should be made compulsory. Breakfast follows at 8.30, and as it is agreed that growing boys, working hard both with brain and muscles, should have meat twice a day, the best arrangement will be to give it in the morning, when the frame craves for nourishment after a prolonged fast. Actual flesh may occasionally be varied by fish, bacon, or eggs, and the quantity allowed need not be large, for we must be careful to keep up the balance between *nitrogenous and* non-nitrogenous food. As Dr. Dukes

writes to me, "Directly we get excess of nitrogenous food and deficient vegetable food, boys will be sure to explode with something, skin eruptions, boils, &c., but even a small amount of meat, if no vegetables be taken, will produce the same result."

Dinner comes at one, and, without laying down any special plan, we must again point to the necessity of variety, and for great care and attention being exercised in the cooking of food. Excellent meat is not only often spoilt, but wasted, by hasty and ignorant preparation, and even good carving is an art not to be despised. In addition to joints, pies and hashes and other dishes may occasionally appear, and vegetable soups and stewed fruits are not only popular but inexpensive modes of varying the dietary.

Tea is of course a light meal, and the gastronomic programme is wound up by something before going to bed, consisting either of bread and cheese and beer, or porridge and milk, the latter being often the more popular of the two. Oatmeal is well known to be an excellent bone and flesh former, and it may also be well to encourage the use of whole-meal flour, from which the valuable nutritive elements of the husk have not been entirely removed.

Eating between meals—gastronomic nipping—must be carefully discouraged, and the medical officer will soon

learn to recognise the symptoms due to gluttonous excess occurring most commonly towards the beginning of term, before the supply of pocket-money has begun to run low; and, as tending to lessen this pernicious habit, house-masters ought to prohibit the sending of hampers stuffed with indigestible dainties from home. Appeal to the common sense of boys will usually succeed in persuading them that digestion can only be thorough and efficient if food be taken at regular intervals, but if any difficulty is experienced on this score, tell them that such regularity is essential to success at cricket and football, and dietetic regulation will at once assume a real importance in their eyes. For the great passion at that time of life is to be in a perpetual state of modified training, and a few hints on the physiology of eating will not only be keenly appreciated, but will tend to keep their wants and desires within reasonable bounds.

Girls are much more liable to be underfed than boys, and the evil consequences of this "chronic starvation" have been so well laid down by Dr. Graily Hewitt, that we cannot do better than give the following quotation from his interesting lecture (*Lancet*, 1879):—

"In the case of young women, between the ages of fourteen and twenty, when the growth is, or should be, *proceeding* at a rapid rate, the amount of material *required for the* building up of the body is very great,

and in these cases an insufficient dietary produces necessarily very marked effects. A common instance of chronic starvation is afforded in the case of young girls who, in consequence of neglect at home, or want of a sufficiently good diet at school, fall into a condition of weakness and debility. Many parents, living themselves in affluence and surrounded by plenty, seem to consider that girls require little food, and the small quantity of meat allowed in some households is chargeable with the inflicting of much after-weakness and ill-health. Schools are, many of them at least, open to the same imputation in regard to the dietary. Bread and butter and puddings are often relied on too exclusively, and the amount of animal food allowed is insignificant.

"Two or three years of such insufficiency in the way of dietary is enough to ruin the soundest constitution. Once for all, I would state my conviction that between the ages of twelve and sixteen or seventeen, during which time girls are either at school or being educated at home, they require at least two good meals of meat daily, and anything short of this appears to me to be insufficient."

These remarks, by an able and experienced observer, who has devoted much special attention to the subject of which he treats, should be carefully considered by parents, as well as by those in responsible charge of

girls' schools, and the dangers so clearly pointed out may readily be avoided, by liberal management, by judicious yet sympathetic discipline at meal times, and by varying the hours of study by brisk exercise in the open air.

The feeding of children at day-schools is, of course, in no way dependent on the superintendence of educational authorities, and, as a rule, we may trust parents to feed their children as well as they can. They are only likely to fail in their duty in this respect either from want of knowledge or want of means, and we may impress upon them the importance of attending to variety, palatability, and regularity, and of not allowing too long intervals to elapse between meals. Want of appetite in children, either means that they do not like their food, or that they are out of health, and the common sense of parents and doctors may be safely relied on to find the appropriate remedy.

Too much praise cannot be given to those industrial institutions where destitute children are fed as well as taught, and from which the melancholy sight is absent of a pale and famishing street Arab, forcing its bloodless brain to attempt work for which it is physically incapable.

Regarding the habitual use of alcohol in early life, the *period of growth* and development is emphatically that

during which nothing of the kind is really required. Boys may be told this; and it must be left to their own discretion to say whether or not they wish to take beer or other stimulant, the decision very often being to prefer water or milk. Cases, however, often will arise where a little alcohol proves of essential service as a nervine tonic, and as whipping up a flagging appetite, and the medical man in attendance will of course be ready and able to give his advice as to the best time and quantity in which it should be prescribed.

We will conclude this chapter with one or two practical hints. In the first place, it is well to see that young people do not bolt their food, but subject it to that regular and systematic mastication which is required to bring it into the state of division necessary for digestive purposes; and in order to encourage this, no hurry or bustle at meal times should be allowed, and boys should be prevented from gulping down their food with that spasmodic haste which they look upon as an economy of time, by being compelled to sit at table at least half an hour for breakfast and tea, and forty minutes for dinner. In order that nervous energy should not be diverted from the stomach, and blood drawn away from the gastric vessels to supply the brain, it is most important that no reading or work should be allowed in the dining-room; that lessons should not begin immediately after dinner, but

that some moderately active game may be encouraged, and aid thus given to those churning moments by which the food is brought fully in contact with the gastric juice.

CHAPTER V.

THE DUTIES OF THE SCHOOL DOCTOR.

WE now come to what we regard not the least important chapter of this little book—the duties of the school doctor. It is no part of our programme to discourse on the principles of education, or to prescribe rules for classical or scientific study, but the considerations of health which we are endeavouring to lay down in these pages belong essentially to the medical man, and it is of the highest importance that he should be placed in a position of acknowledged responsibility. For this purpose he ought to be regularly appointed as the professional adviser of the educational authorities, whose trusted colleague and consultant he must ever strive to be; and, if possible, it is advisable that his emoluments should be sufficient to enable him to devote all his time to the duties of his office. Payment by head-money, and not by fees, will be far the most satisfactory arrangement, *as preventing* the insinuation naturally proceeding from

coarse minds, that extra attentions during sickness are to be ascribed rather to greed than to a conscientious regard for duty, and will enable his aid to be summoned at all times, and on even trivial occasions. If he succeed in obtaining the confidence and good-will of masters and boys, he may keep up a constant and almost unsuspected supervision over the little community, seeing where health is apparently failing; where physical strain appears imminent, or where anything wrong in sanitary construction or in athletic arrangement seems to require putting right; and in this unobtrusive fashion his duties will not only afford the highest social and scientific satisfaction to himself, but may render him able to contribute largely to the advance of practical medicine in a direction which has hitherto been but little worked. He must not be disappointed, however, if he finds that he is forced to pick up much of the detail of his every-day practice for himself. Supposing that he has just emerged from the schools, polished up to the highest pitch of shining perfection, able and willing to write an elaborate examination paper on anything within the range of medicine, and to diagnose and treat all those definite types of disease which are so neatly mapped out in books and lectures, he will still find himself not a little at sea when suddenly placed in medical charge of a large school. The wards have supplied him with examples either of complicated

chronic maladies, or of acute affections developed into that stage when their recognition is comparatively easy; and although the out-patient room occasionally brings him nearer the premonitory period of doubt and difficulty, the hurry and scramble of these over-worked departments prevent him from taking full advantage of their undoubted opportunities. In his new sphere of work, he is continually brought in contact with a great variety of apparently trivial symptoms, and he must decide promptly and firmly as to their nature and meaning. Prognosis is naturally of supreme importance from the master's point of view, and his keen and well-disciplined intellect, and the precise nature of his own studies, renders it difficult for him to understand the unavoidable inexactness of the science of medicine, and the doubts which so often perplex the doctor's mind. And not only the science itself, but the doctor as its exponent, will lose caste in his estimation, if the nature of an eruption or a sore throat cannot be instantaneously determined, or if the cause of a heightened temperature is not comprehended at once. And we can quite understand this; for nothing can be more irritating than the firm establishment of measles or scarlet fever in a school, simply because the medical man was too inexperienced to detect those very early symptoms by which they might have been recognised. *It will,* we fear, be taken as no excuse that those

early symptoms are but little known, or if known, never taught; and the doctor will need to bring all his acuteness to bear on his difficult task, and when he is obliged to plead ignorance, to let caution take the place of knowledge, and strict quarantine be enforced in every doubtful case. Further than this, however, it is important that any boy returning after being ill at home should be carefully examined; and, indeed, at the beginning of term it would be an advisable precaution to have a superficial medical inspection made, by which any lingering traces of sickness may be detected, and, if necessary, referred to treatment.

It is also quite impossible in many instances to tell how any particular epidemic arose, nor can we even say whether the more common among them can arise spontaneously, but one fertile means of propagation is the folly or duplicity of parents sending their children back to school before convalescence from scarlet fever is fully established. It is not very uncommon for a boy to return after the holidays in the full activity of desquamation, and it is charitable to suppose that the attack having been a mild one, passed over unobserved, rather than that the home authorities ignored the dangers to himself and others, because they did not wish the chain of learning to be interrupted for too long.

It is only a *reasonable* precaution that boys on their return

should bring a certificate to the effect that they have been in good health, or, if they have been ill, have suffered from such or such symptoms. But we are inclined to advocate even a further extension of this sort of health registration, somewhat after the pattern of the medical history sheets used in the army, of which a somewhat simplified imitation is here appended, giving headings under which the

Name.	Age.	Weight.	Chest Measurement.

Pulse Rate.	Respiration.	General Physical Development.

Vaccination Marks.	Family History.

Previous Medical History.

Medical Register of observed Illness and Treatment.

height, chest measurement, pulse and respiration rates at various ages may be recorded, and the illnesses of childhood briefly inserted. When the boy comes to school, these papers should be taken in charge by the doctor, who thus finds out, on better evidence than that of mere hearsay, what has already been passed through, and what may be expected in the future. On the sheet will, of course, be recorded all school-illnesses and accidents, and when he goes home for good, a most invaluable record will accompany him for the benefit of his family and of those medical men who have to treat him in after-life.

It is most important that house-masters should be encouraged to consult the doctor about all ailments, however apparently trifling, which affect their inmates, for the experienced eye can often detect coming danger around symptoms which would hardly excite the attention of the uninstructed; and consultations may frequently, and with great advantage, take place concerning the health of boys, the master, from his intimate knowledge of their usual appearance, being readily able to detect any deviation from the ordinary standard of colour or expression, and an experienced housekeeper may often be of service in observing any incipient derangement of health. One should hardly be inclined to advise any regular or formal medical inspections; but the doctor

should make it his duty to be much among the boys, watching and perhaps even sharing in their sports, and so far gaining their confidence and good-will that they will readily come to him in all their little troubles. In this way he will very quickly see if anything is going wrong, if dulness or listlessness, or depression or unusual inattention at school hours, or deficient energy at play, show that something is amiss which a timely word or a timely dose may put right.

Every house ought to contain a sick-room, where boys with headaches or digestive derangement may remain for a day or two under supervision, and from which they can be drafted to the hospital when suspicion warrants; and here the thermometer does us good service. A slight rise in the body heat need not cause much alarm, for we know that feverish conditions are readily lighted up in childhood by insignificant and temporary derangements. When the temperature, however, keeps over 100° for forty-eight hours, it is more prudent to place the patient in quarantine at once, for if anything infectious is incubating, this timely precaution will probably prevent its spread; and if the illness is to be quite evanescent, the rest in bed, and the coolness and quietness of the ward, will tend to more speedy convalescence. The hospital must be carefully constructed according to the best principles of modern hygiene, and for a school numbering

five hundred must furnish room for at least thirty beds; it should be superintended by an experienced nurse, of kindly manner, but sufficient firmness to ensure discipline; the wards may contain from two to four, and a cheerful day-room should be provided for convalescents. Although it is quite possible to arrange wings so essentially detached from one another as to provide pretty effectual isolation in cases of infection, it is almost impossible to prevent the occasional contact of nurses, nor that mixture of clothes by the laundress which has not infrequently caused the mysterious spread of scarlet fever in hospitals. Perfect security will therefore be better ensured by the erection of a small and entirely separate "dependence," solely for infectious disorders.

What is to be said about malingering? That it exists we cannot possibly doubt; but its frequency will depend partly on the professional and social respect in which the doctor is held, partly on the general good tone and standard of morality sustained in the school. If boys can be persuaded—and surely the task cannot be a difficult one—that it is as contemptible and cowardly, and as bad form to act as to speak a lie, there would be no more trouble on this score; and indeed we do not believe that the practice prevails to any great extent in our great schools. Young medical men are particularly apt to *plume themselves* on their detection of feigned disorders,

but however sharp they may imagine themselves to be, we would advise them to use great caution before they rashly decide whether any particular boy is shamming. We cannot conceive anything more galling to the self-esteem than to be told that a headache or pain in the back does not exist because the doctor cannot appreciate the subjective sensations which are only too familiar to the patient; and it is far better to be deceived over and over again than to let one suffering victim be branded with the offensive accusation of imposture.

DISEASES MOST COMMON IN SCHOOL LIFE.

The preceding general account of the duties of the school doctor naturally leads up to the diseases which he will be called upon to treat, and although this is in no sense a purely medical book, some few details on the subject can hardly be looked upon as out of place.

From the school point of view infectious disorders must always take the first place in importance, on account of the danger, inconvenience, and expense which only too surely follow in their train. Parents, however, if they had their choice, would not unnaturally prefer that their children, if they must have these things at all, should *take them with* their Latin and Greek at school, whilst *masters, on the* other hand, would choose home as the

most convenient arena for the battle with infection. We have only to consider the possible results of an epidemic in a community of 400 or 500 boys, the difficulty of checking its fully developed progress, and the probability of the school being at last broken up, to understand the serious anxiety of a house-master when the first case of scarlet fever is reported to him. But if he has entire faith in his medical adviser, and if this faith is fully justified by skill and knowledge, he will at last come to know that these solitary cases, although they often will arise in the most mysterious way, will usually remain sterile, and that this anxiety will soon be at an end.

We wish it were possible to give any general advice regarding the best way of keeping large schools apart from infection. The subtle germ may be communicated in such a vast variety of insidious ways, that it is impossible to do much in the direction of real precaution, and this remark is especially true of day-schools, where the pupils are exposed to contagious influences over which their masters have no control, and in consequence of which these institutions become most efficient means for the spread of infectious disease. All we can at present endeavour to suggest are the principal diagnostic indications by which we know that any of these troublesome *affections are to* be suspected, and we shall begin with

scarlet fever, the most widespread, perilous, and justly dreaded of all.

Its onset is usually sudden, frequently ushered in by vomiting, headache, and pains in the limbs, but in my experience sore throat is the earliest symptom of which the patient complains. In one case a boy, while at tea, felt all at once as though a piece of bread had stuck in his throat. Next morning he grew sick and faint, and the eruption appeared. Some feel sore and chilly, and believe that they have taken cold, and one had experienced so much pain and stiffness in his legs that he had some difficulty in going upstairs. The tongue is large, flabby, and moderately furred, but does not assume its characteristic aspect until the appearance of the eruption, the peculiar punctated character of which it is unnecessary to describe. The throat is red, the palate covered with granular prominences, and the tonsils enlarged and covered with whitish flakes, which, when once seen, leave no doubt as to the character of the disease.

Doubt may occasionally arise in our minds, when called to see nettle-rash in some of its many forms, and when we find that a boy, after some sickness and headache, is invaded by a scarlet eruption, composed of punctated spots, and associated with sore throat and *general* febrile disturbance, we may feel ourselves some*what puzzled.* But we may generally come to a right

decision by observing that the skin, by its itching and tingling, is evidently the main source of discomfort; that the throat affection is entirely confined to œdema and redness, and that the thermometric indications of increased temperature are not sufficient to balance the local phenomena. Such cases are not uncommon, as a consequence of stomach derangement, following too frequent visits to the confectioner, and it is very satisfactory to be able to allay the alarm and anticipation of evil which their appearance suggests. Remembering that the eruption of scarlet fever appears first on the chest, we must make a careful inspection of that region in every doubtful case, and not forget the wonderfully developing power of a few hours in a warm bed. The medical man must also bear in mind that roseola æstiva, ague, quinine, and belladonna, may produce rashes very similar to those of scarlet fever, but it is not likely that real doubt will often be created by such exceptional possibilities. But still greater difficulty will be experienced with some of those cases of tonsilitis, where rigors, aching in the limbs, hot skin, rapid pulse, and furred tongue, seem to point to something serious. The character of the throat, and the want of sharpness, so to speak, of the fever, may lead us to a correct judgment, but it will now and then happen that the most careful examination will not do more than suggest the propriety

of suspending our verdict for twenty-four hours. And if we accept the opinion of some, that we may have a scarlatinous angina without any trace of rash, our difficulties are largely increased, and peeling may alone give rise to a suspicion of what the real nature of the attack has been. But it is satisfactory to note that our best authorities do not recognise such abnormalities, or consider them so rare that it is hardly necessary to give them serious attention.

The desquamative stage of scarlet fever is that which causes so much inconvenience and danger. Sometimes copious and complete, it may be almost entirely absent, or amount to little more than a branny dust, and again may relapse with an irritating persistence, when the patient is about to leave hospital. It usually begins about the roots of the nails, and the transverse furrow occasionally left across the nail itself may put us on the right track of suspicion, and enable us to declare that the patient has recently passed through an attack. It is well to keep the convalescent in bed until the peeling process is pretty well over, and on no account to allow him to return to school until every morsel of dead cuticle has been fairly thrown off. It may be considered a hardship to keep a boy in idleness until an obstinately tough piece of skin consents to leave the tip of his heel; *but parents may* console themselves by the reflection

that scarlet fever seems specially to exhaust and weaken the mental powers, and that a long rest is required before work can be profitably resumed. It is a great convenience for a school to be provided with a farm-house, or other country convalescent station, where boys may spend the latter part of their quarantine before being sent home.

Careful disinfection of everything worn by the patient, and of beds, bedding, &c., is most necessary, and can be rapidly and efficiently done by means of Nelson's well-known apparatus. Exposure of from five to twenty minutes to a temperature of 300° is sufficient in almost every case.

Measles is usually gradual in its onset, beginning with languor, want of appetite, listlessness, and debility, which are apt to be considered due to, and to be treated for, simple gastric derangement. The patient looks dull and heavy, is fretful and sleeps badly, tossing about restlessly, and wandering from time to time. There is generally a short, sharp cough, and the invariable conjunctional injection appears—sometimes early, but, more frequently, rather late, among the premonitory symptoms; the temperature is seldom raised more than one degree previous to the appearance of the eruption. The rash hardly requires description, for the dull red papules beginning first on the root of the nose and forehead are thoroughly

well known, although iodide of potassium, chloral, and copaiba, as well as some of the varieties of nettle-rash, may cause a temporary doubt in the mind of even the experienced medical attendant. Under the name of Rötheln, or German measles, an exanthem has been described, which, according to Dr. Murchison, is a compound of the eruption of measles with the scarlatinous sore throat; in short, a true hybrid. The discussions which have subsequently taken place have much confused the subject, and have developed, as usual, much difference of opinion, the type now accepted by many being nothing more or less than the well-known roseola, or rose-rash, of which I have seen several epidemics. It consists of a number of discrete small pink spots, not elevated above the skin, and attended by so little constitutional disturbance as to be occasionally discovered by accident, but being most infectious, and occasionally apt to develop into true measles, it deserves to be treated to all the ceremony and honours of isolation.

In mumps, which frequently follows measles, we meet with slight feverish symptoms, followed by pain on movements of the jaw, depending on the fact that the portion of the parotid in front of the ear is invariably first attacked, and can be felt as a painful swelling; and if we attend to this we may readily dispel the false alarm often excited during an epidemic by the acute enlarge-

ments of the cervical glands secondary to ulceration of the tonsils.

In small-pox we usually meet with persistent headache and flushing of the face, bleeding at the nose, a peculiar dulness and heaviness of aspect, sickness and pain in the back. The eruption first appears on the left side of the forehead, at its junction with the hairy scalp; and sore throat, with papules on the mucous membrane, generally follows.

In chicken pox, after a period of mild febrile disturbance, a few delicate vesicles begin to appear on the face, neck, and, occasionally, throat. Their presence on the scalp I should look upon as pathognomonic.

Whooping-cough is usually got over in the nursery, and it is fortunate for medical officers of schools that their diagnostic skill will not be often called upon to decide whether a persistent cough is or is not pertussis. We can give no advice on this point, for detection at the early stage is as difficult as it is easy when the characteristic whoop proclaims the existence of the disease to all within hearing.

The onset of enteric fever is so insidious and gradual, and the characteristic spots follow so long after the full development of the disease, that mistakes may readily occur, and may give rise to inconvenient and even fatal errors of treatment. Dr. Murchison says that

if "diarrhœa coexists with frontal headache, disturbed sleep, and general febrile symptoms, increasing towards night," we may suspect typhoid,-and it is hardly probable that we shall get nearer than this in the way of general direction. The clinical tact of the physician, and the care, which should always increase in proportion to the obscurity of the case, will usually guard the patient from the evil consequences of error. We must remember that the brain often recovers slowly from the weakening influence of an attack of this disease, and that parents should be dissuaded from sending the patient back to school until a very thorough convalescence is established.

We have already drawn the attention of our readers to the difficulties of diagnosis presented by some forms of sore throat, and diphtheria may be overlooked, or mistaken for scarlet fever, by those who see it for the first time. But a ready clue will be given by the alarming degree of prostration and constitutional disturbance, far out of proportion as they are to the apparently local case.

The medical man must also be on the outlook for a variety of follicular tonsilitis, which is extremely infectious, and may rapidly run through a school. The appearances are very characteristic, consisting as they do of brilliant whitish specks standing out in bold relief from an intensely injected mucous membrane; and the occurrence of such a case should be followed by immediate

isolation; and, under such epidemic conditions, it is well to become suspicious of the efficiency of hygienic precaution, and more especially of the purity of the water supply.

The medical man must be prepared with an answer to the invariable query of how soon so and so may come back to school, after an attack of any infectious disorder; and we should recommend him to be very cautious in his reply. Cases seem to differ from one another in the force and continuance of their contagious powers, and we must be guided partly by the severity of the attack, partly by the constitution of the sufferer; and it is best to err on the safe side, and suggest in most cases a tolerably prolonged holiday from work.

Under the heading of infectious diseases must be placed several of the varieties of skin disease from which children suffer. Contagious impetigo is often extremely common in the day-schools attended by the poorer classes, and may readily be recognised by the yellowish heaped-up crusts usually observed on the chin, and associated with enlarged glands and small whitlows on the fingers.

Bad food is responsible for the existence of some forms of cutaneous affections; for Dr. Graham Balfour has shown, at the Duke of York's school, that obstinate skin affections of the head were only finally eradicated when

substantial improvements were made, under his direction, in the dietary.

Surgical Affections.—Surgical diseases are rare during school life, but accidents requiring professional aid are occasionally met with, although with a rarity altogether out of proportion to the apparent roughness of the games usually played. The collar bone may be fractured by a fall at football, and the diagnostic powers of the doctor may be seriously taxed to distinguish between a severe strain of the wrist and a broken radius, the common-sense advice being invariably, in any case of doubt, to treat the minor as though it were the major ailment, and prevent the evil consequences of mistake by putting the limb carefully up in splints. Sprained ankles, bruised and broken shins, and trifling cuts and blows, which rapidly heal up and leave no bad consequences behind, give little anxiety to the medical attendant; but his ingenuity will often be taxed for the successful management of those obstinate serous effusions which now and then follow a twisted knee-joint. The persistent nature of this form of "Hydrops articuli," and its evil influence on health, as interfering with outdoor exercise, make it an object of some anxiety, and its removal can often be only effected by prolonged rest and change of air and scene.

Another affection, which we do not remember to have

seen described in books, is a swelling around the ligamentum patellæ at its insertion into the tibia, not unlike the condition known as a curb in a young horse, and arising much in the same way from a strain. Insignificant as this may seem to be, it is surprising how it weakens the limb, and its cure will also entail a considerable amount of time, care, and attention.

Eye affections.—We have already referred to the researches of Liebreich with reference to the development of short sight during school life, and his explanation of the cause. Cöhn, of Breslau, has also investigated the subject, and has examined a large number of children, with the startling result of finding at least 10 per cent. to be myopic, the tendency increasing with age. In addition to the evil influence of the faulty construction of seats, he believes much in the influence of light and glare, and points out how the bent position throws increased strain on the accommodation muscle, causing an augmented hydrostatic pressure towards the posterior segment of the eye-ball, with elongation of its axis, and congestion of the globe from intercepted return of blood. We may, however, take comfort from the reflection that short sight is far more common in Germany than here, this being considered due to the badly-printed school books habitually in use. There is no doubt, however, about the tendency to the development of this condition

during the educational period, and the rapidly progressive character which it often assumes. Comparatively few people are born shortsighted, and it is little satisfaction to the sufferer in after-life to reflect that the weakness or imperfection of vision which causes him constant discomfort, and may even seriously damage his future prospects of success, has been acquired on account of arrangements which might have been remedied by a very little care and knowledge. The parent of the future will no doubt be sufficiently instructed to see that his son's eyes are not damaged because an architect obstinately adhered to his own notions of where windows should be placed, but, in the meantime, the medical man must take care that no harm is being done. Whenever a boy holds his book nearer than ten or twelve inches to the eye an experienced oculist should be consulted, and suitable glasses provided, if necessary.

Some interesting investigations have taken place with reference to the inveterate persistence of ophthalmia in some schools, and the remedies proposed for its prevention and cure. Mr. Nettleship has reported on some of these epidemics for the Privy Council, and has advised strongly against the overcrowding of boys in dormitories, the promiscuous use of towels, against bad light and air, *and insufficient food*; and under his judicious guidance *much good has* been effected.

Curvature of the spine in its relation to schools, has also attracted a good deal of attention, and we have given a brief *résumé* of Liebreich's valuable researches. We diagnose the slighter cases by observing "that the right shoulder projects more and is lower than the left. That the ribs below the shoulder-blades also project more on the right side than on the left. That the lateral outline, which runs from the arm-pit to the legs, is on the left side almost straight, whilst on the right side it shows above the hip a strong bend. That the right hip stands higher than the left, and that the whole pelvis has an oblique position." (Liebreich.) Its frequency, in greater or less degree, is very considerable; F. Guillaume (quoted by Virchow) finding it in about 30 per cent., and, as already pointed out, girls are much more subject to it than boys.

In addition to diagnosing and treating developed ailments, the medical officer in charge of a school must bear the various diatheses and acquired constitutional tendencies in mind, and see that none of them are likely to be forced into injurious operation by the processes of education. Taking the period during which his superintendence comes into play as that between six and nineteen years of age, he will see that the development of inherited enthetic disease, or of rickets, is not likely to engage his attention, and that the first peril of childhood which

seriously concerns him is tubercular meningitis. It is only up to the age of twelve that this is likely to appear, but this is really the most dangerous time, for it is then that the soft and pliant mind is being first brought in contact with learning, and is being forcibly bent into habits of discipline and regular work. The earlier symptoms of this inevitably fatal disease are so gradual and obscure as to be frequently overlooked; but suspicion should be aroused whenever a child of tubercular predisposition begins to mope and pine, sleeps restlessly, and loses flesh. Any permanent diminution in the fresh and elastic spirits, universal at this early age, without ostensible cause, should be looked upon with distrust, and the medical man thus put upon the scent will seldom fail to discover other indications of the coming evil. It is only too probable that things may have already gone so far as to render ultimate recovery more than doubtful, the only hope being at once to knock off all work, and place the little sufferer under the best possible hygienic conditions, and in the enjoyment of the most nutritious food and the purest air. It is no part of our duty to furnish a description of the disease when fully developed, for its progress is only too well known, and its prognosis is most unsatisfactory. But a very careful study of its *premonitory* symptoms must be made, and foremost *among these, as* previously remarked, we must place

dullness and depression, disturbed sleep, a capricious appetite, and a wasting so gradual as to be at first quite unobserved; added to this we usually find a love of work and that sharpness and quickness of intellect so dear to schoolmasters, but which should always be regarded with suspicion at that early age, as indicating a morbid activity of brain. The education of any child born with a strong family history of tubercular disease should be conducted with extreme caution, and should even be altogether delayed until much later than usual. For it will be found that the mind, having been encouraged to remain fallow until the constitutional vigour is thoroughly established, will soon make up for lost time; whereas the infant prodigy, if it survives the forcing process, usually turns out a failure in after-life.

Other indications of tuberculosis may appear in later years, and what is ordinarily known as consumption most generally begins to cause anxiety about the stage of puberty. Here, again, diagnosis is difficult at first, and is much aided by a careful study of family history, and of the previous illnesses of childhood; but if a boy or girl steadily loses flesh, coughs habitually, and sweats at night, we hardly require the confirmatory evidence of physical signs to put us on the right track. When the verdict has been fairly given, all work must at once be *put aside, and* the patient sent to some suitable health

resort; but when suspicion is as yet hardly established, the depression of the constitutional state will be best counteracted by the bustle and variety of school life, and the lungs themselves will not suffer by a moderate amount of active use. Indeed, it is not unreasonable to suppose that the vigorous filling and emptying of the air cells will render them less susceptible to the intrusion of plastic deposits, and that the enhanced bodily vigour attending the reasonable use of athletics may prevent that tendency to "catching cold" which always furnishes an element of danger to those disposed to pulmonary trouble. The diet should here be specially liberal, and the use of fat encouraged, the functions of the skin should be strictly attended to by bathing and vigorous rubbing, and any exposure to wet or damp should be immediately followed by a change of clothes, and under this careful *régime* the young may often safely tide over this dangerous period of life.

Chronic bronchitis and asthma will often occur as the result of early attacks, and must be treated when they arise on general principles, much the same hygienic precautions being enforced as those which we have just laid down; and struma in its many forms, whilst requiring careful attention, need not be considered as necessarily *disabling a child* from enjoying the benefits to be derived *from the discipline* of school life.

Among the most inveterate plagues of school life must be ranked ring-worm in its several forms, of which tinea tonsurans is the most common. The children of the poor rarely escape an attack of this disease, which, although neither painful nor dangerous, is unsightly and obstinate, frequently running on for months, and even years, in spite of the most persevering attempts at cure. Depending as it does on the presence of a minute vegetable parasite it is extremely contagious, and being readily spread by contact, we can understand what an efficient machinery for its dissemination is furnished by day-schools, and how it occasionally assumes almost an epidemic form in boarding schools. Prompt and effective isolation, and disinfection of all articles of clothing, must be enforced where individual cases occur, and the treatment is conducted according to the unfortunately scarce knowledge which we possess of how best to bring every deeply-seated germ under the influence of the appropriate drug.

Itch, although rarely met with in the upper classes, is by no means uncommon among that section of the community which is now so indiscriminately huddled together in our board schools. Being also of parasitic origin it is naturally extremely contagious, and every case must be promptly isolated until a perfect cure is effected.

A very difficult question will arise when a medical man is consulted about the education of a child who inherits a strong neurotic tendency. Supposing that a boy is hereditarily predisposed to insanity, or has suffered, however slightly, from fits, is it wise to send him to a public school? On the one hand, the steady discipline and careful moral and intellectual training of such an institution will be much better for him in many ways than the indulgence and greater consideration which he naturally meets with at home, whilst, on the other hand, the rougher life and harder work may exert an injurious influence over his nervous system; but, on the whole, we should unhesitatingly give our own vote in favour of school. The mental and bodily tonic provided by the due admixture of work and play is sure to exert a bracing influence, and perhaps prevent the brain from going wrong, although common sense would indicate the propriety of keeping the victim of confirmed and severe fits under somewhat more careful supervision; and, indeed, in all cases having a family history of mental disease, or chorea or hysteria, or any of the numerous nerve storms which so often arise from a common origin, it is well that the medical man's attention should be aroused, and that he should impress on the educational authorities that fits of temper and depression, and stupidity and eccentricity of manner, should not be regarded as offences punishable

under his code of law, but should be looked upon as symptoms requiring investigation and, probably, treatment.

It will be seen that the subject of school hygiene, on which we have endeavoured to touch in the preceding pages, is one of great extent, and considerable complication, and that the recorded materials at our disposal are both scanty and scattered. The Germans, with their accustomed industry, have accumulated much valuable information, principally statistical in character, but the very different domestic arrangements of the two countries prevent effective conclusions being drawn from such evidence. Ventilation can hardly be looked upon as their strong point, the close stove heat so universal abroad causes headache and inconveniences which are not met with here, and outdoor games are only conspicuous by their absence. Under these circumstances, therefore, we have been obliged to depend on the writings of English authorities, supplemented, as far as possible, by our own experience, and, in this way, to construct a brief manual of our subject, complete, we may venture to hope, at least in form. Objection may of course be taken to any precise treatment of the health of schools, on the plea that the ground is already traversed by the ordinary works on physiology and hygiene, and that such special headings as we have

furnished are in reality out of place. It must, of course, be admitted that school buildings must be planned on ordinary principles, and that advantage must be taken of the best science and apparatus to make their drainage and ventilation and water supply as perfect as possible. Boys, it may be said, do not differ much from men in the necessities of their dietary, and the limits within which athletic sports, whether of mind or body, may be safely indulged. But granting all this, we are sure that masters and doctors and parents will agree with us in thinking that it is very necessary that clear and definite rules should be laid down for their guidance, and that the acknowledged facts of science and custom should be adapted to the peculiar conditions of boys and girls *in statu pupillari*.

All we have attempted to do is to lay down broad general principles, which may be amplified and varied according to the discretion of head-master and medical man, and which may be studied by parents and perhaps even by boys and girls. "Health in Schools" of course includes not only those costly and well-appointed institutions which can afford to adopt every suggestion of modern science, but also such struggling foundations and private enterprises where economy must necessarily reign supreme, and the vast educational chain which *now encircles our* population under school-board superintendence. We have strictly avoided mentioning any

individual institution by name, not only because such special selection would be both invidious and improper in a work of this class, but because the commissioner of the *Lancet* published a few years ago in that paper the details of a most interesting tour of inspection made by him round the principal public schools, to which we refer our readers for more special and detailed facts regarding the arrangements which he examined with so much care. (Vide *Lancet*, 1875.)

After all, the moral to be drawn is that parents should cease to select their schools solely on account of the eminence of head master and staff, or of the successes gained in the arena of competition; but should look very carefully and narrowly into all sanitary arrangements, and be very much guided by the completeness of these. Most great schools can be trusted to give a complete education if boys are willing to learn, and to furnish those principles of discipline and high-toned morality which are so eminently characteristic of the English character; but if trustees and head masters knew that parents not only comprehended, but were prepared to demand that amount of hygienic precaution which will shortly be considered as at least of equal importance to architectural display, they would perhaps be more zealous in keeping themselves in the van of progress. Great improvements, however, have been effected in this respect

within later years, and educational authorities really do seem thoroughly earnest in their wish to keep the health of their pupils fully on a level with the well-trained excellence of their minds. In all such arrangements, the medical officer must work cordially and harmoniously with his employer; and whilst fully instructed in the best schools of hygienic science, he must be prepared to enforce his views with all the modesty, yet decision of a savant, tempered with the give-and-take diplomacy of a man of the world. And in this way, and in this way only, will those who undertake the management of the young justify the very serious responsibilities of their position, and will parents feel that their children are not to have unnecessary and artificial dangers added to those with which Nature has already surrounded the earlier years of life.

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